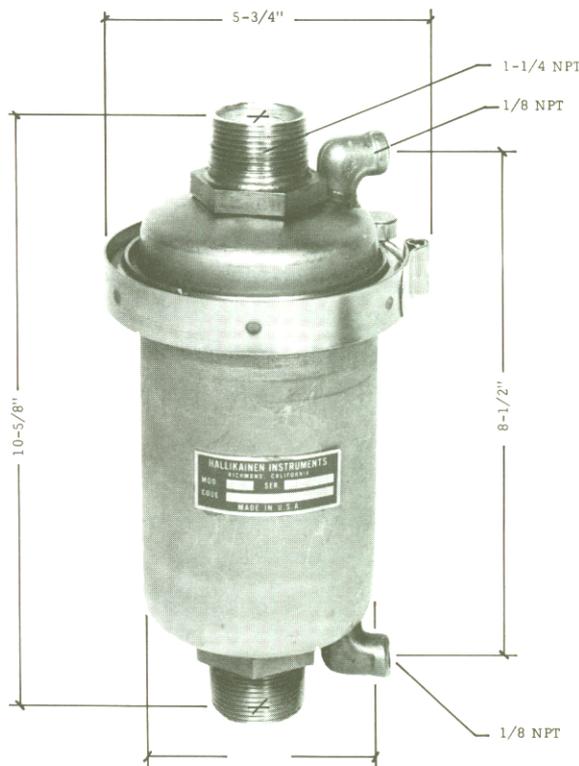


## FILTER-COALESCER

Model 1363

The Hallikainen FILTER-COALESCER solves the twofold problem of filtering and water-coalescing liquid sample streams with a one package unit. The element will not react chemically with the sample, change its state, or inhibit its flow. In addition, the element and housing are designed to minimize residence volume, and thereby reduce overall sampling system response time.



The general configuration chosen for the Hallikainen FILTER-COALESCER was to satisfy several requirements.

1. Large filter surface area to minimize the pressure drop produced by very viscous products.
2. Ease of assembly, installation and element replacement.
3. A coaxial flow to produce a self-draining action while simultaneously providing a high flow rate sweepstream.
4. A minimal water settling volume outside the coalescing section of the element which would also permit free water dropout and collection during maximum flow of conditioned sample.
5. Simple and reliable pressure sealing.
5. High element life or conversely, high holding capacity.

The use of a simple clamping band around the flanges formed to hold a Quad ring, permits the joint to be closed or opened quickly. The nature of the Quad ring seal obviates the necessity of high clamping pressure to produce a secure and reliable leak-free joint. The housing is designed for a working pressure of 450 psig (test 600 psig).

The FILTER-COALESCER element is rated for a minimum differential pressure of 100 psi without structural failure. It has been designed for maximum filtration efficiency by using many overlapping layers of successively varying fibreglass density and fibre diameter. Three (3) progressive bands are used to hold dirt. A conservative removal rating based on test is 2 microns. The capacity of the FILTER-COALESCER is about 4 GPM (based on kerosene.)

In addition to the high efficiency of the unique fibreglass construction, an inner strainer core of perforated stainless steel tubing serves as the initial filtering surface and supports the element against bending. Radial burst strength is provided by a fibreglass screen wound around the third band of the element.

The sweepstream flowing at a high rate through the unimpeded uniform central bore of the element carries with it most of the solid contaminant by virtue of the high momentum and simultaneously produces a self-cleaning action by washing away particles which might have a tendency to cling to the screen surface or lodge in the perforations. This self-cleaning characteristic not only increases the life of the filter section of the element by sweeping away contaminants but also reduces the load on the coalescing section since it tends to also keep the heavier water-flow droplets suspended in the main coaxial stream flow path.

The coalescer section is wound around the fibreglass screen that reinforces the third filtering band and is fabricated of coarse 300 millionths diameter fibres. This coarse fourth band is used exclusively for coalescing water as solid contaminants have already been entrapped in the three preceding graduated bands.

An important aspect of fabrication of the FILTER-COALESCE element is the type of fibreglass used. The phenolic resin which binds the fibres together are cured **after** the element is formed. This technique prevents binding, warping, squeezing and often breaking of the fibres as they are forced into the shape required.

The resin used in the FILTER-COALESCE to bind the glass fibres may be used with caustic solutions to a pH of approximately 9.

To further assure that none of the coalesced water enters the effluent stream, a separator barrier is employed. A double polyurethane foam settling sock around the fibreglass elements aids in removing water. An inner coarse porosity layer of foam holds the coalesced drop until it builds up to a sufficient size by combining with other drops, that flow downward against the upward flow of water-free sample. The second outer layer of fine porosity foamed urethane permits sample flow of water-free sample at the top while forcing coalesced water out at the bottom.

The product leaving the coalescer, although it is completely void of free water, may nevertheless exist as a 100% saturated solution at the existing temperature. If this exit temperature is higher than ambient, any further cooling in the line connecting the FILTER-COALESCE with the analyzer intake will cause water to precipitate out of solution. It is obvious therefore, that the sample must be cooled sufficiently **prior** to its entry into the coalescing element to avoid downstream water dropout.

A cooling coil which can be inserted in the unit is under development as an accessory item. This coil, it appears, will lower sample temperature from 10° to 50°F. depending on sample inlet temperature and flow and cooling water temperature.

GENERAL SPECIFICATIONS

FILTER-COALESCER Contaminant Removal Rating —2 micron, or better

FILTER-COALESCER CAPACITY-	For Zero By Pass	With By Pass Flow Rate 4 X Sample Flow Rate
	ml/min.	ml/min.
#1 Diesel Oil, Gas Oil or Materials with Sp. Gr. .82 to .90	500	1000
Kerosene or Materials with Sp. Gr. of .78 to .82	750	1500
Gasoline or Materials with Sp. Gr. of .68 to .78	1000	2000

FILTER-COALESCER Liquid Volume -

Approx. 300 ml

Pressure Limitation-450 psig

Temperature Limitations-250°F.

Materials of Construction-All metal parts in contact with sample are 316 stainless steel

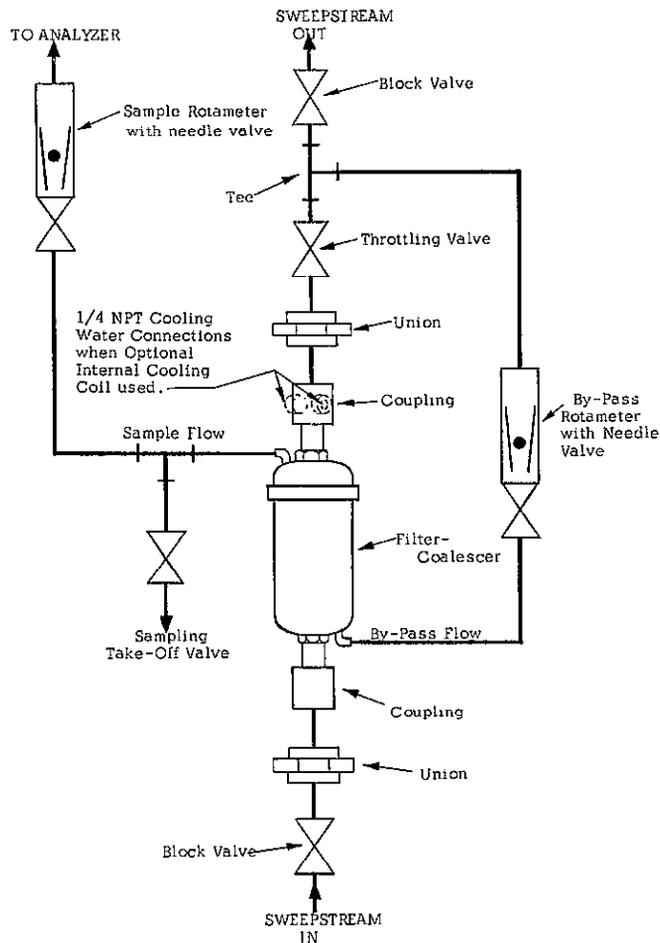
Connections-

Sweepstream Sample In-1 1/4" NPT

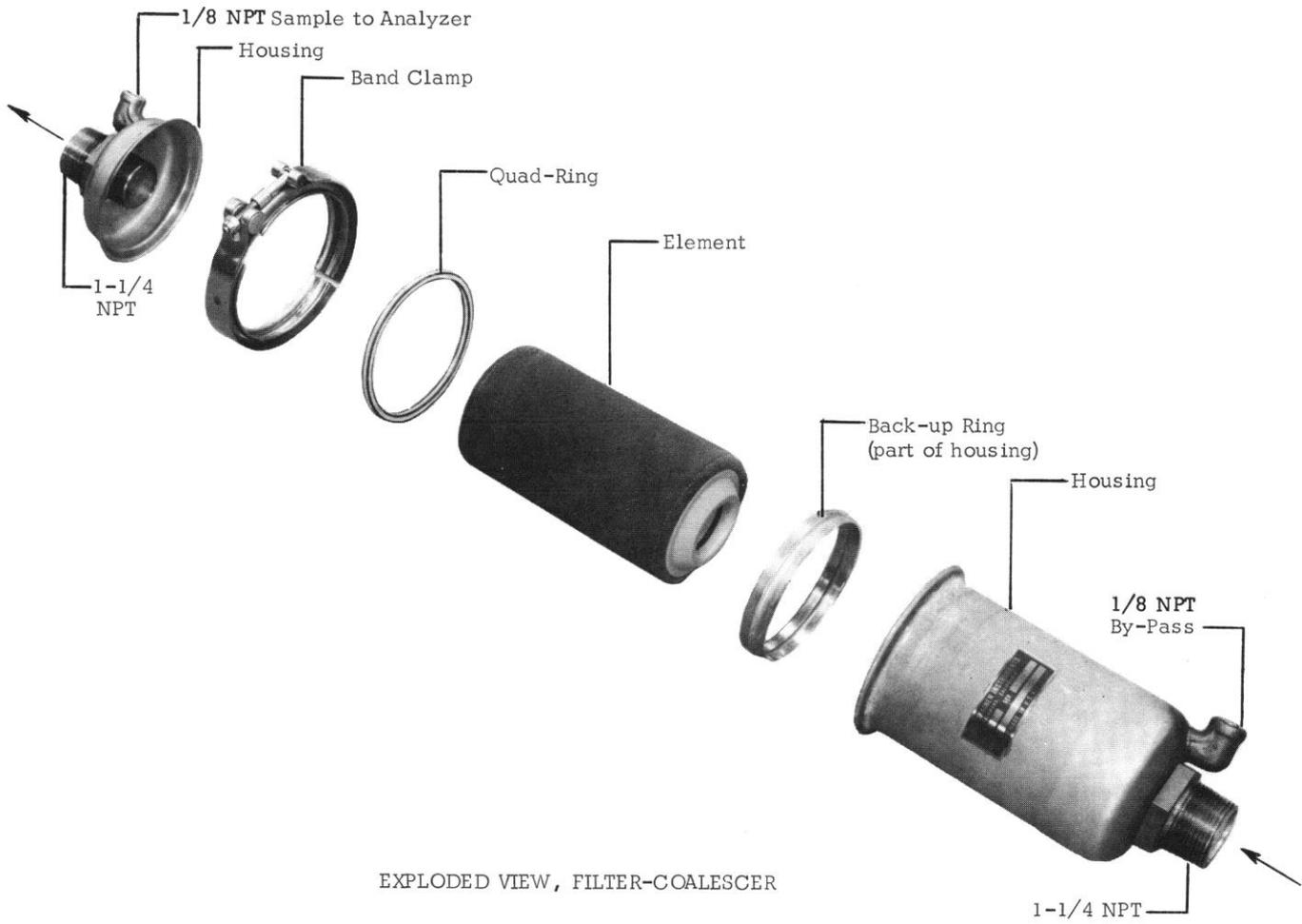
Sample Out-1 1/4" NPT

Dry Sample & Drain or Bypass-1/8" NPT

FILTER-COALESCER Element Burst Strength >100 psi ΔP



RECOMMENDED PIPING



Part Numbers for Replacement Parts  
 Quad Ring -BY-505  
 FILTER-COALESCER Element - CF-489  
 Band Clamp - EU-572